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| 09/839,028      | 04/19/2001  | Antonius Henricus Elisabeth Breuls | 750034.427C2        | 2396             |

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EXAMINER

HASSANZADEH, PARVIZ

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1763

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/839,028

Applicant(s)

BREULS ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 20 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1, 2 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1, 2 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 19 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beerwald et al (US Patent No. 4,473,596) in view of Rau et al (US Patent No. 4,877,938) and Echizen et al (US Patent No. 6,253,703 B1).**

Beerwald et al teach a microwave induced plasma system for coating the inside surface of a quartz glass tube by reactive deposition from a gas flowing through the tube which is subsequently drawn into fibers (see drawing and column 1 lines 5-16).

In an embodiment of the apparatus, a gas mixture of O<sub>2</sub> and SiCl<sub>4</sub> flows through the nozzle 2 into the quartz tube 3 to be coated. A plasma 6 is produced by means of a microwave apparatus consisting of a magnetron 7, a unidirectional transmission line 8, and a plasma producing device 9 (column 1, line 59-61 and column 2, lines 1-16), wherein as shown in the

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drawing the longitudinal axis of the waveguide is perpendicular to the cylindrical axis and does not intercept the silt and does not bisect the resident cavity.

Beerwald et al fail to explicitly teach the relationship between the cavity width and microwave wavelength.

Rau et al teach a microwave cavity suitable for internal coating of a tube. As illustrated in Fig. 1, the resonator 3 has a movable wall surface 31 which can be moved for *tuning the resonant frequency to the operant frequency* (column 3, line 65-68 and column 4, lines 5-8). The choice of the ratio of diameter to height of the resonator to generate a resonance of a given mode and a given wave type is established according to the formula known in the art (column 2, lines 60-68). The resonant frequency depend on the overall length of the inner resonance space (column 3, lines 43-50). Thus, Rau et al teach a mechanism for varying the length of the resonator. However, Rau et al fail to teach a mechanism for varying the width of the resonator.

Echizen et al teach a cylindrical cavity resonator 22 (Fig. 1) having a plunger 23 for varying the length of the cavity resonator 22, and a pair of cylindrical sliding matching irises 24 for varying the width and the length of the microwave introduction opening (aperture:  $96 \times 27$  mm) that is coupled to waveguide 21 (column 6, lines 15-21). The plunger 23 and the irises 24 are adjusted so as to reduce reflected power (column 7, lines 46-58). In another embodiment as shown in Fig. 4, the irises 24 slide in the direction indicated by the double-head arrows and thus varying the with of the opening (column 8, lines 46-59). Thus, Echizen et al teach a mechanism for varying the length as well as the width of a resonator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement microwave cavity adjusting mechanism as taught by Rau et al and

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Echizen et al in the apparatus of Beerwald et al in order to optimize the resonator length and width to obtain a proper resonance condition for an operating microwave frequency.

Further regarding the recited relationship between the width and the wavelength: the opening of the cavity as taught by Echizen et al is 27 mm and the microwave frequency has a frequency of 2.45 GHz (column 1, line 47 and column 8, line 1) corresponding to a wavelength of about 120 mm (Handbook of Chemistry and Physics, page 10-258). Thus  $\lambda/10$  is about 12 mm and  $\lambda/35$  is about 3.4 mm. Since the width of the opening having a maximum width of 27 mm can be varied by the irises, it can be selected to be more than 3.4 and less than or equal to 12 mm as recited in the claim.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Toraguchi et al (US Patent No. 6,161,498)* teach a microwave plasma source wherein electric field in plane E and plane H can be adjusted.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Examiner  
Art Unit 1763

April 18, 2003